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ART UNIT	PAPER NUMBER
2836	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/063,290	ZAREI, SHAHRAM	
	Examiner	Art Unit	
	Hal I. Kaplan	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/19/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: paragraph 10, line 7 contains the phrase "a second direction signal". It appears this should be "the second direction signal". Paragraph 11, line 3 contains the phrase "...hybrid-electric vehicle. Thereby, allowing high-voltage loads..." It appears this should read "...hybrid-electric vehicle, thereby allowing high-voltage loads..." Paragraph 21, line 8 contains the phrase "which supplied". It appears this should read "which is supplied". Paragraph 22, line 6 contains the phrase "in an addition". It appears this should read "in addition". Paragraph 22, line 7 contains the phrase "from standstill". It appears this should read "from a standstill". Paragraph 22, line 9 contains the phrase "vehicle 12 re-start during standstill". It appears this should read "vehicle 12 is re-started during a standstill".

Paragraph 24, line 5 contains the phrase "when ISG is operating". It appears this should read "when the ISG is operating". Paragraph 24, line 7 contains the phrase "when converter is operating". It appears this should read "when the converter circuit is operating". Paragraph 26, line 7 contains the phrase "electrical power or the mechanical power". It appears this should read "electrical power to mechanical power". Paragraph 32, line 2 contains the phrase "ISG 40". It appears this should read "ISG controller 40". Paragraph 32, line 6 contains the phrase "mode applying to up-conversion". It appears this should read "mode applies to up-conversion". Paragraph 32, line 7 contains the phrase "mode applying to down-conversion". It appears this should read "mode applies to down-conversion". Paragraph 32, line 8 contains the

phrase "ISG 40". It appears this should read "ISG controller 40". Paragraph 40, line 4 contains the phrase "applications containing requiring the maintenance". It appears this should read "applications requiring the maintenance".

Appropriate correction is required.

Drawings

2. The drawings are objected to because of the following informalities: Reference numeral 28 in Figure 1 points to a structure labeled "low-voltge bus". It appears this should read "low-voltage bus".

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 35 in Figure 1 (see paragraph 21, lines 8-9).

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 62 in Figure 2. 62 is mentioned in the written description of Figure 3, but it should also be mentioned in the written description of Figure 2.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 10 and 19 are objected to because of the following informalities: Claim 10, line 5 contains the phrase "load signal". It appears this should read "load signal; and". Claim 19, line 8 contains the phrase "a open state". It appears this should read "an open state". Appropriate correction is required.

6. Claim 21 line 2, the phrase "said voltage conversion" lacks proper antecedent basis. It appears this was meant to depend from claim 20. Appropriate correction is required.

7. Claim 10 is objected to under 37 CFR 1.71(a) because the specification does not contain a written description of the invention. Claim 10 contains the limitations "generating a converter circuit status signal" and "in response to said converter circuit status signal". The specification does not disclose a converter circuit status signal. Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 22 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 22 contains the limitation "before executing said high-loading mode on an integrated starter generator". The specification states that the integrated starter generator (ISG) controller determines whether the system is to perform a high-voltage (high-loading) mode or a low-voltage mode (see paragraph 32, lines 1-2) before the high-voltage or low-voltage mode is initiated on the converting circuit (see paragraph 32). The specification does not disclose what is meant by executing the high-loading mode on the ISG, or what happens to the ISG after the high-voltage or low-voltage mode is initiated on the converting circuit.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 6-8, 10, 15-17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by the US patent of Ruthlein et al. (5,698,905).

As to claim 1, Ruthlein, drawn to a hybrid propulsion system for a motor vehicle

and a method of operating the hybrid propulsion system, teaches, in Figures 1 and 1a, a power supply (7,13) that is read on the claimed soft hybrid electric vehicle power supply circuit, comprising: a load sensor generating a load signal (see column 7, lines 31-37); a high-voltage bus (9) supplying a high voltage (see column 6, lines 58-60) for a high-voltage load (see column 7, lines 23-31); a low-voltage bus electrically coupled to and supplying a low-voltage to a low-voltage load (see column 7, lines 50-58); and a converter circuit (25) electrically coupled to the high-voltage bus (9), the low-voltage bus, and the high-voltage load, the converter circuit (25) maintaining a predetermined minimum voltage level (500-1000 V; see column 6, lines 58-60) on the high-voltage load by switching between the high-voltage bus (9) and the low-voltage bus in response to the load signal (see column 7, lines 58-67).

As to claims 6 and 15, the circuit of Ruthlein further comprises a high-voltage energy storage device (27) electrically coupled to and supplying power to the high-voltage bus (9) (see column 8, lines 24-26).

As to claims 7 and 16, the circuit of Ruthlein further comprises a low-voltage energy storage device (21) electrically coupled to and supplying power to the low-voltage bus (see column 7, lines 54-56).

As to claims 8 and 17, the converter circuit (25) of Ruthlein maintains a predetermined minimum voltage level (500-1000 V; see column 6, lines 58-60) during soft hybrid-electric vehicle engine high-loading periods (see column 8, lines 19-24).

As to claim 10, the circuit of Ruthlein further comprises: an engine (5) propelling the soft hybrid electric vehicle (see column 6, lines 4-5); an engine controller (15)

determining the status of the engine and generating a load signal (see column 7, lines 23-37); and a converter circuit (25) generating a converter circuit status signal upon switching between the high-voltage bus (9) and the low-voltage bus (see column 7, lines 60-67 and column 8, lines 17-24), the engine controller (15) signaling the engine (5) to draw power from the high-voltage bus (9) in response to the converter circuit status signal.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 2-4 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of the US patent of Gale et al. (6,304,056).

Ruthlein teaches all of the claimed elements, as set forth above, except for an integrated starter generator (ISG) supplying power to the high-voltage bus or an engine, an ISG control circuit electrically coupled to the integrated starter generator and the

high-voltage bus, the ISG control circuit signaling said ISG in response to the load signal and adjusting performance of the ISG, and the ISG control circuit comprising an inverter and an ISG controller.

Ruthlein teaches a generator (7) supplying power to the high-voltage bus (9) (see column 6, lines 56-57), but the generator of Ruthlein is not an ISG.

As to claims 2 and 11, Gale, drawn to a pulsed charge power delivery circuit for a vehicle having a combined starter/alternator, teaches, in Figure 1, an integrated starter generator (ISG) (10) supplying power to a high-voltage bus (see column 2, line 65 through column 3, line 2; and column 3, lines 8-9). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to build the circuit of Ruthlein with the ISG of Gale, because an ISG is smaller and takes up less space than a starter and alternator would separately, and the ISG of Gale increases efficiency.

As to claims 3 and 12, the ISG (10) of Gale further comprises: an ISG control circuit (12,16) electrically coupled to the ISG (10) and the high-voltage bus, the ISG control circuit (12,16) signaling the ISG (10) in response to a load signal and adjusting performance of the ISG (10) (see column 3, lines 30-36 and 57-60).

As to claims 4 and 13, the ISG control circuit (12,16) of Gale further comprises: an inverter (12) processing electrical power between the high-voltage bus and the ISG (10); and an ISG controller (16) electrically coupled to the inverter (12) and determining when to process electrical power (see column 3, lines 57-60).

15. Claims 5, 14, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of the US patent of Itoh et al. (5,796,175).

As to claims 5, 14, 19, and 21, Ruthlein teaches all of the claimed elements, as set forth above, except for a bi-directional switch and a bi-directional converter electrically coupled to the bi-directional switch and controlling the switch, the bi-directional converter controlling the direction of voltage conversion from either the high-voltage bus to the low-voltage bus or from the low-voltage bus to the high-voltage bus to maintain the predetermined minimum voltage level on the high-voltage load.

Itoh, drawn to a power supply control device for an electric vehicle, teaches, in Figure 2, a bi-directional switch (3) (see column 4, line 6); and a bi-directional converter (12) electrically coupled to the switch and controlling the switch (see column 3, lines 60-62), the converter controlling the direction of voltage conversion from either the high-voltage bus (4) to the low-voltage bus (5) or from the low-voltage bus (5) to the high-voltage bus (4) to maintain a predetermined minimum voltage level on the high-voltage load (see column 2, lines 60-62 and column 3, lines 3-10). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to build the circuit of Ruthlein with the bi-directional switch of Itoh, in order to allow the high-voltage load to remain at a sufficiently high voltage regardless of the voltage on the low-voltage bus.

16. Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of the US patent of Arai et al. (6,191,558).

Ruthlein teaches all of the claimed elements, as set forth above, except for the predetermined minimum voltage level being approximately 30 volts.

Arai, drawn to a battery controller and junction box with the same battery controller, teaches, in Figure 1, a power supply circuit for a vehicle comprising a

converter circuit maintaining a predetermined minimum voltage of approximately 30 volts (36 V; see column 3, line 57) on a high-voltage load (3) by switching between a high-voltage bus (7,9) and a low-voltage bus (4) (see column 3, line 47 through column 4, line 10). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to build the circuit of Ruthlein with the 36 V predetermined minimum voltage of Arai, because 36 V is much less likely to cause a fault or damage to components than 500-1000 V.

17. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of Itoh, and further in view of the US patent of Kanazawa et al. (5,767,636)

Ruthlein in view of Itoh teach all of the claimed elements, as set forth above, except for the steps of determining time to perform a voltage conversion; determining a power rating for the voltage conversion; and determining a duration of time to perform the voltage conversion.

Kanazawa, drawn to an alternator control circuit and related techniques, teaches: determining time to perform a voltage conversion (between the minimum and maximum amplitude of the pulse when the leading pulse signal is detected) (see column 3, line 46); determining a power rating for the voltage conversion (see column 3, lines 49-60); and determining a duration of time to perform the voltage conversion (period of receiving the pulse signal) (see column 3, line 44). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to perform the voltage conversions of Ruthlein in view of Itoh, using the method of Kanazawa, in order to allow power generation control in accordance with the vehicle accessories.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hal I. Kaplan whose telephone number is 571-272-8587. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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